

REMARKS/ARGUMENTS

These remarks are in response to the Final Office Action dated June 17, 2005. Claims 1-27 and 29-47 are pending in the present application. Claims 1-27 and 29-47 have been rejected. Claims 1-27 and 29-47 remain pending. For the reasons set forth more fully below, Applicant respectfully submits that the claims as presented are allowable. Consequently, reconsideration, allowance, and passage to issue are respectfully requested.

In the event, however, that the Examiner is not persuaded by Applicant's arguments, Applicant respectfully requests that the Examiner enter the arguments to clarify issues upon appeal.

Claim Rejections - 35 U.S.C. §102

The Examiner has stated:

Claims 1, 2, 4-6, 9-11, 13-15, 18-20, 22-24, 27, 29-34, 36, 38-44, and 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Wilson et al. (US 6,651,117 B1).

INDEPENDENT:

As per claims 1, 2, 6, 10, 11, 15, 19, 20, and 24, Wilson teaches of a network having a sending computer system and a receiving computer system, each of the sending and receiving computer systems including a processor, a memory (see col. 7, lines 24) and a network adapter (see col. 6, line 10: NIC), the memory containing a data structure used for storing a common data buffer (see col. 6, lines 44-48), a method, system, and a computer readable medium containing a computer program, for sending and receiving payload data by layers or sub-layers (see Fig. 1) of at least one communications protocol (see abstract), the method comprising the steps of: (a) storing a first start pointer pointing to a first byte of the payload data in a first common data buffer of the sending computer system (see col. 6, lines 62-67); (b) adding a first header (see col.3, line 59-60) to the payload data in the first common data buffer at a location preceding the byte pointed to by the first start pointer according to a first protocol layer of the communications protocol at the sending computer system (see col.6, line 67 to col.7, line 4); (c) adjusting the first start pointer to point to a first byte of the first header (see col. 6, lines 5-8); (d) invoking a send procedure of a second and lower protocol layer of the communications protocol at the sending computer system (see col.6, lines 62-64 and col.8, lines 34-35); (e) transferring to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure (see col.2, lines 59-61; col.3, lines 51-58; and col.6, lines

1-8); (f) adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer (see col.6, line 67 to col.7, line 4) {NOTE: Wilson teaches essentially that prior art network layer communication is allowed (see col.3, lines 51-52), thus the number of protocol layers does not functionally distinguish the invention and furthermore, after each succession of layers the pointers are clearly adjusted (see col.6, lines 5-8)}, wherein the second header is contiguous with the first header (see Fig. 3 and col. 6, lines 31-33 & 36-38); (g) sending the payload data and the first and second headers to the receiving computer system (see col.8, lines 34-35); (h) storing the payload data and the first and second headers in a second common data buffer of the receiving computer system (see col.9, lines 10-12)}, wherein the second header is contiguous with the first header (see Fig. 3 and col. 6, lines 31-33 & 36-38); (i) invoking a receive procedure of a second protocol layer of the communications protocol at the receiving computer system (see col.9, lines 19-24); (j) storing a pointer and end pointer to the payload data and also storing a second start pointer pointing to a first byte of the second header in the second common data buffer (see col.9, lines 45-48); (k) adjusting a the second start pointer to point to the first byte of the first header according to the second protocol layer at the receiving computer system (see col.6, lines 5-8); (l) invoking a receive procedure of a first and higher protocol layer of the communications protocol at the receiving computer system (see note above and col.9, lines 19-24); and (m) transferring to the first protocol layer at the receiving computer system the second start pointer (see note above), wherein the payload data is not copied in preparation for or during the receive procedure (see col.2, lines 59-61; col.3, lines 51-58; and col.6, lines 1-8).

Response to Arguments

Applicant's arguments filed December 20, 2004 have been fully considered but they are not persuasive. *Wilson* clearly teaches the element of the amended claims.

With respect to the argument presented by the applicant(s), the cited Figure 4 of the *Wilson* patent is describing a specific situation wherein the data packet to be transmitted is too large to transmit as a single packet and must be broken up into smaller "chunks" (see col. 7, lines 38-50). Such technique is well known in the art wherein a header precedes the payload portions for successfully re-joining the chunks at the receiving device. The functionality taught by *Wilson* does not specifically apply to the recited broad limitation of the claimed invention because the claimed invention does not recite wherein the data is transmitted in partitioned chunks:

Wilson teaches in column 6, lines 31-33 & 36-38 with reference to Fig. 3, that the SID header portion includes a common SID header and a layer specific SID header, which clearly teaches of a "second header contiguous with a first header".

Furthermore, *Wilson* teaches of overcoming conventional prior art technique of buffer copying as data is processed from one layer to the next (see col. 2, lines 25-56). Such prior art technique is well known wherein the header of each layer is appended next to the previous header (contiguous). *Wilson* teaches of an interface that is "essentially standardized, thus allowing similar routines to use the interface" (see col. 2, lines 62-63). The main distinction of *Wilson* patent over prior art is replacing buffer descriptors including memory address pointers (see col. 3, lines 11-12) in place of payload data to "greatly reducing the amount of copying performed during inter-layer communication" (see col. 3, lines 2-5).

Applicant respectfully disagrees with the Examiner's rejections. The present invention provides a method for allowing the sharing of code between communications protocol layers and for eliminating the need for copying payload data between protocol layers in a sending system before the payload data is sent and between protocol layers in a receiving system after the payload data is received. A table describing seven standardized protocol layers (the "OSI Model") can be found in the specification beginning on page 2, line 11. The method of the present invention is accomplished by the creation of a generic protocol layer class (GPLC) having send and receive procedures and a common data buffer in which sent or received payload data is placed and acted upon by each protocol layer implemented with the GPLC. Instead of copying the payload data passed to it by a higher or lower protocol layer, a protocol layer acts upon the common data buffer by moving a "start" pointer and an "end" pointer along the data contained in the common data buffer prior to invoking the next higher or lower protocol layer. A first header and a second header are stored in the common data buffer at a location preceding the first start pointer, where the second header is contiguous with the first header. Each protocol layer can then process the payload data without it having to be copied. This reduces the amount of memory and processing time required for processing the payload data. (Summary, Figure 9, and page 15, lines 3-9.) Wilson does not teach or suggest these features, as discussed below.

Wilson discloses a network stack layer interface for communication between network stack layers. The network stack layer interface includes a header portion that defines various characteristics of the network stack layer interface. In addition, a buffer descriptor is included that defines data that was, or will be, transmitted over a computer network. The buffer descriptor includes a memory address pointer to the data. In this manner, information is passed between network stack layers via the network stack interface, resulting in fast network data transfer with reduced data copying. (Abstract.)

However, Wilson does not teach or suggest "storing a first header and a second header to the payload data in a common data buffer, wherein the second header is contiguous with the first header," as recited in independent claim 1. The Examiner has referred to column 6, lines 31-33 and 36-38, of Wilson as teaching this feature. However, these sections of Wilson merely state that the SID header portion preferably "includes a common SID header and a layer specific SID header" (column 6, lines 31-33) and that "the layer specific SID header includes data that is

particularly useful for the specific layer utilizing the SID” (column 6, lines 36-38). Nowhere do these sections specifically describe the structure of the SID header, and these sections clearly do not specifically describe that the common SID header and the layer specific SID headers are contiguous. Furthermore, nowhere do these sections teach or suggest the rest of the feature, “adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer,” as recited in the present invention.

With regard to the teaching of Wilson where multiple non-contiguous headers are described (Figure 4 and column 7, lines 38-50), the Examiner has stated that the functionality of Wilson does not specifically apply to the claimed invention because the claimed invention does not recite that the data is transmitted in partitioned chunks. However, Figure 4 is an “exemplary SID flow” that Wilson uses to transmit data in a network environment. The advantage of the present invention, where the headers are contiguous, is that only one start pointer is needed. Wilson does not provide this benefit since the headers of Wilson are not contiguous. Consequently, numerous pointers are required in Wilson to locate each header. If the functionality of Wilson does not specifically apply to the claimed invention, as suggested by the Examiner, Applicant respectfully submits that Wilson should not be applied to the claimed invention, since Wilson does not teach or suggest “adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer, wherein the second header is contiguous with the first header,” as recited in the present invention.

Furthermore, not only does Wilson not describe the above-described adding feature, including contiguous headers, but Wilson also does not teach or suggest “transferring to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure,” as recited in independent claim 1. The Examiner has suggested that Wilson overcomes conventional prior art of buffer copying, referring to column 2, lines 25-56, of Wilson. However, Wilson in this section clearly describes copying, where “copying is used to pass processed data from one network stack layer to the next.” This section further states that “the entire data buffer must be copied to a new buffer each time a new network stack layer needs to access it” (column 2, lines 39-48). Wilson mentions in column 2, lines 62-63, an interface that “should be essentially standardized, thus allowing similar routines to use the interface,” as suggested by the Examiner. However, this section does not

teach or suggest that “payload data is not copied in preparation for or during send and receive procedures using protocol layers,” as recited in the present invention. In fact, where the Examiner points out the main distinction of Wilson over the prior art (column 3, lines 2-5), Wilson merely describes that an interface is configured to pass memory address pointers, thus “greatly reducing” the amount of copying performed during inter-layer communication, and that information is passed between network stack layers via the network stack interface, resulting in fast network data transfer with “reduced data copying.” Clearly, data copying still exists in Wilson and is merely “reduced.” These descriptions strongly suggest that Wilson teaches away from the present invention as claimed, where payload data is not copied in preparation for or during send and receive procedures using protocol layers.

Therefore, Wilson not teach or suggest the combination of steps as recited in independent claim 1, and this claim is allowable over Wilson.

Independent claims 2, 6, 10-11, 15, 19-20, 24, 29, and 38-39

Independent claims 2, 6, 10-11, 15, 19-20, 24, 29, and 38-39 recite transferring, a start pointer, “wherein the payload data is not copied in preparation for or during the send procedure,” and storing a first header and a second header to the payload data in a common data buffer, “wherein the second header is contiguous with the first header.” As described above, with respect to independent claim 1, Wilson does not teach or suggest this feature. Accordingly, the above-articulated arguments related to independent claim 1 apply with equal force to claims 2, 6, 10-11, 15, 19-20, 24, 29, and 38-39. Therefore, these claims are allowable over the cited reference for at least the same reasons as claim 1.

Claim Rejections - 35 U.S.C. §103

The Examiner has stated:

Claims 3, 7, 8, 12, 16, 17, 21, 25, 26, 35, 37, 45, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (US 6,651,117 B1) in view of Boucher et al. (US 6226680 B1)...

Applicant respectfully disagrees with the Examiner’s rejections. Dependent claims 3, 7, 8, 12, 16, 17, 21, 25, 26, 35, 37, 45, and 47 depend from independent claims 2, 6, 11, 15, 24, 29,

and 39, respectively. Accordingly, the above-articulated arguments related to independent claims 2, 6, 11, 15, 24, 29, and 39 apply with equal force to claims 3, 7, 8, 12, 16, 17, 21, 25, 26, 35, 37, 45, and 47, which are thus allowable over the cited reference for at least the same reasons as claims 2, 6, 11, 15, 24, 29, and 39.

Remaining dependent claims

Dependent claims 4-5, 9, 13-14, 18, 22-23, 27, 30-34, 36, 40-44, and 46 dependent from independent claims 2, 6, 11, 15, 20, 24, 29, and 39, respectively. Accordingly, the above-articulated arguments related to independent claims 2, 6, 11, 15, 20, 24, 29, and 39 apply with equal force to claims 4-5, 9, 13-14, 18, 22-23, 27, 30-34, 36, 40-44, and 46, which are thus allowable over the cited references for at least the same reasons as claims 2, 6, 11, 15, 20, 24, 29, and 39.

Conclusion

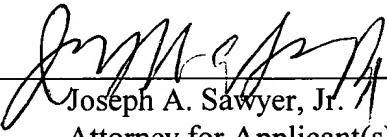
In view of the foregoing, Applicant submits that claims 1-27 and 29-47 are patentable over the cited reference. Applicant, therefore, respectfully requests reconsideration and allowance of the claims as now presented.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, the Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

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Date



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